

REMARKS

Introduction

Claims 1-3, 5 and 6 are pending with claims 1 and 6 being independent. In response to the final Office Action dated December 3, 2008, Applicants have amended claims 1 and 6. The support for these amendments is found, for example, at page 15, lines 7-8 of the specification of the present application. Care has been taken to avoid the introduction of new matter. Claim 5 has been withdrawn. In view of the foregoing amendments and the following remarks, Applicants respectfully submit that all pending claims are in condition for allowance.

Claim Rejection - 35 U.S.C. § 102 and 103

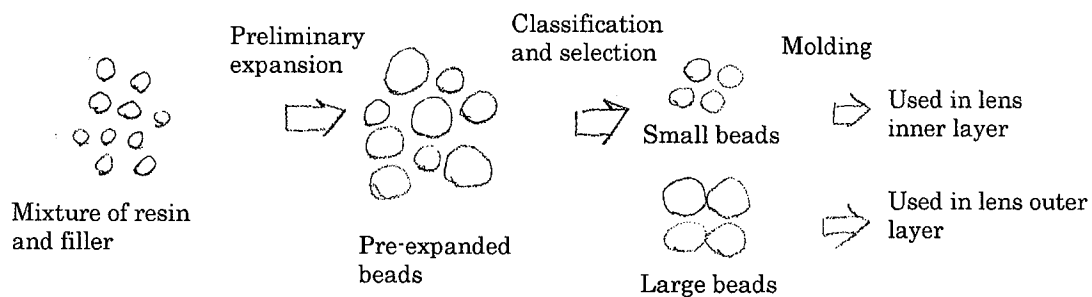
Claims 1-3 and 6 were rejected under 35 U.S.C. § 102(b) as anticipated by or, in the alternative under 35 U.S.C. § 103(a) as obvious over Peters et al. (U.S. Patent Number 3,332,765).

Applicants respectfully submit that the Luneberg lens in Peters is made by a process different from the process of the present application and thus the resulting Luneberg lens of Peters does not exhibit the properties disclosed in the present application. The difference of the processes between Peters and the present application is explained as below, using reference drawings Figs. A and B.

Fig. A exemplarily shows the process of the present application and Fig. B shows the process disclosed in Peters. According to the amended claim 1, the mixture of the resin and the filler is substantially uniform. In the present application, a foaming agent is added thereto to conduct preliminary expansion, but the resulting pre-expanded beads vary in size or specific gravity. The dielectric constants of the pre-expanded beads also vary with size or specific

gravity. For example, the degree of expansion of small pre-expanded beads is low and thus such pre-expanded beads have a high dielectric constant. In the present application, the dielectric constants are made uniform by classifying and selecting the pre-expanded beads. The classified and selected pre-expanded beads are charged in a forming mold and expansion-molded to obtain a foamed dielectric layer. During this process, small beads (beads having higher dielectric constants) are used in the lens inner layer and large beads (beads having lower dielectric constants) are used in the lens outer layer (see, page 12, line 13 to page 16, line 2 of the specification).

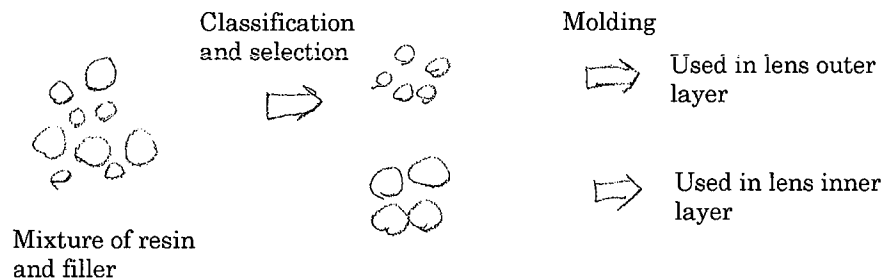
Fig. A Method described in the present application



In contrast, the mixture of the resin and the filler disclosed in Peters contains granules of various sizes (see, column 4, lines 63-71 of Peters). In Peters, the granules of the mixture are preliminary classified and selected by size. Accordingly, the classified granules vary in size, but have the same dielectric constant. The classified and selected granules are charged into a mold and expanded to obtain foamed dielectric layers. During this process, larger granules are used for an inner shell of the lens and smaller granules are used for an outer shell of the lens. This is because the degree of expansion required to form the inner shell is small since the inner shell is

to have a high density (high dielectric constant), and the degree of expansion required to form the outer shell is large since the outer layer is to have a low density (low dielectric constant). Meanwhile, the post-expansion granules (particles) are still small enough to permit uniform loading of the molds (see, column 4, line 63 to column 5, line 1 of Peters).

Fig. B Method described
in Peters



In other words, in Peters, granules are classified to permit uniform loading. As the Examiner pointed out, column 5, lines 24 to 26 of Peters indicate that the particles may be sieved after expansion, but this is conducted “in order to obtain improved uniformity, especially for the shells of lower density.” This means that post-expansion particles may be used to permit uniform loading of the mold.

As such, it is clear that the claimed lens is patentably distinguishable from the lens of Peters in the following points:

- (1) While the mixture of the resin and the filler before pre-expansion is uniform in size in the present application, the mixture according to Peters varies in size.
- (2) While the mixture is pre-expanded in the present application, the mixture in Peters is not pre-expanded.

(3) While in the present application, after classification, the small beads are used to form the lens inner layer and the large beads are used to form the lens outer layer, the small particles are used in the lens outer layer and the large particles are used in lens inner layer according to Peters.

According to Peters, classification of particles is conducted to permit uniform loading, and preliminary expansion may be conducted to increase the particle size merely because achieving uniform loading is difficult with small particles.

As such, the technical idea and the process of the present application are different from those of Peters, and thus the Luneberg lens of Peters is different from the Luneberg lens of claim 1. Further, it would not be obvious for persons skilled in the art to modify the process of Peters to obtain the Luneberg lens of the present application.

Further, as apparent from the mathematical equation in the claim, the Luneberg lens of the present application is constituted by a foamed dielectric layer having a highly uniform dielectric constant. This is achieved by using the above-discussed process of the present application, in particular, by using the mixture classified after preliminary expansion to make the dielectric constant uniform. Peters neither teaches nor recognizes this advantage.

As such, it is clear that claim 1 and any claims dependent thereon are patentable over Peters. Since claim 6 has amended in substantially the same manner as claim 1, this claim is also patentable over Peters. Thus, Applicants respectfully request that the Examiner withdraw the rejection of claims 1-3 and 6.

CONCLUSION

Having fully responded to all matters raised in the Office Action, Applicants submit that all claims are in condition for allowance, an indication for which is respectfully solicited. If there are any outstanding issues that might be resolved by an interview or an Examiner's amendment, the Examiner is requested to call Applicants' attorney at the telephone number shown below.

To the extent necessary, a petition for an extension of time under 37 C.F.R. § 1.136 is hereby made. Please charge any shortage in fees due in connection with the filing of this paper, including extension of time fees, to Deposit Account 500417 and please credit any excess fees to such deposit account.

Respectfully submitted,

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